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PATENT SPECIFICATION



Application Date: Nov. 16, 1938. No. 33261/38.

521,410

Complete Specification Left: Nov. 13, 1939.

Complete Specification Accepted: May 21, 1940.

PROVISIONAL SPECIFICATION

Improvements in or relating to the Packing of Materials in a Powdered, Granular, Flaked, or the like form

We, GILBERT HAWORTH, British Subject, of 45, Gladstone Street, Castle, Northwich, in the County of Chester, and SOUTHALE & SMITH, LIMITED, a British Company, of 149 and 155, Villa Street, Hockley, 19, Birmingham, do hereby declare the nature of this invention to be as follows:—

10 This invention relates to the packing of substances in a powdered, granular, flaked or other comminuted form. In the packing of flour and other substances in a comminuted form it is customary to put a measured or weighed quantity of the substance in a paper or like bag, carton, tin, 15 or other container into which the substance is compressed or caused to settle by the packer banging the bottom of the bag or container on the counter until it 20 forms a compact mass therein when the open end of the bag or container is closed by folding over the upstanding edges of the same or the like and the object of the present invention is to provide means for 25 automatically causing the comminuted substance to settle into a comparatively small bulk ready for the closure of the wrapper or container.

30 According to the present invention the measured or weighed quantity of flour or like powdered material or material in a granular condition, for example, sugar, or flaked condition, for example crushed 35 oats, soap flakes or the like, is placed or fed into the container such as a paper bag, carton, tin or other container resting on or delivered to a vibrating table, conveyor band or the like which causes the bag or carton to vibrate so that the particles of 40 powdered and like material settle into a compact mass of the smallest dimensions ready for the top edges of the package to be closed over by hand, or mechanically, in known manner.

45 A suitable device for mechanically effecting the settling of the powdered or like material comprises a comparatively small table mounted on a yielding

support, for example rubber or spring blocks, and having a comparatively small 50 electric motor secured to the underside, said motor being provided with an unbalanced spindle or rotor so that a very rapid vibration of the table is set up as the motor revolves, suitable means being 55 provided, if desired, to control the intensity of the vibrations. For example, screw means may be provided for the resilient supports of spring or rubber to limit the extent of movement and/or the 60 rotor may be provided with means to adjust the extent of unbalanced weight, for example, two equal weights may be provided, which when mounted diametrically opposite each other would 65 counterbalance each other but which may be adjusted angularly relatively to each other to obtain any desired intensity of vibration.

If desired the vibrating table may be 70 placed at a slight inclination to the horizontal plane so that the packages will be simultaneously traversed to the packer whilst being vibrated and in the case of automatic scales and the like the arrangement may be such that the circuit to the 75 motor will be automatically completed when the balance arm or like moving part of the scale descends at the end of the weighing stroke and automatically opened 80 when the filled package is moved.

Instead of mounting the motor on the vibrating table motive power from any suitable source may be utilized and transmitted to the vibrating element through 85 a belt drive or gearing. By these means flour, sugar, oatmeal and like powdered, granular, or flaked food stuffs, soap and like commodities are more quickly packed and in a more uniform manner than heretofore. 90

Dated this 14th day of November, 1938.

J. B. HAYWARD,
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COMPLETE SPECIFICATION

Improvements in or relating to the Packing of Materials in a Powdered, Granular, Flaked, or the like form

We, GILBERT HAWORTH, British Subject, of 45, Gladstone Street, Castle, Northwich, in the County of Chester, and SOUTHALL & SMITH, LIMITED, a British Company, of 149 and 155, Villa Street, Hockley, 19, Birmingham, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to the packing of substances in a powdered, granular, flaked or other comminuted form. In the packing of flour and other substances in a comminuted form it is customary to put a measured or weighed quantity of the substance in a paper or like bag, carton, tin, or other container into which the substance is compressed or caused to settle either by the packer banging the bottom of the bag or container on the counter until it forms a compact mass therein or by machinery comprising a shaking or vibrating platform upon which the filled container is placed and having an eccentric unbalanced weight carried by a spindle which runs in bearings to effect vibration to automatically cause the comminuted substance to settle into a comparatively small bulk, ready for the closure of the wrapper or container, and the object of the present invention is to provide improvements in such automatic filling or packing machinery.

According to the present invention the measured or weighed quantity of flour or like powdered material or material in a granular condition, for example, sugar, or flaked condition, for example crushed oats, soap flakes or the like, is placed or fed into the container such as a paper bag, carton, tin or other container resting on or delivered to a vibrating table, conveyor band or the like, embodying a rigid table mounted on a resilient or yielding support comprising strong volute springs surrounded by comparatively thick rubber tubes so arranged that whilst the table is normally stable it is capable of vibration as a whole within substantially the plane of support.

A rotating spindle is journaled in bearings carried by a suitable bracket below the table adapted to be rotated by means of a spindle, and to which intermediate of the bearings is keyed an unbalanced weight preferably a segment of a cylinder constituting with the spindle an un-

balanced rotor or vibrating element having a driving pulley at one end adjacent one bearing and a balanced rotating weight or fly wheel adjacent the bearing at the other end so that it can be rotated by a belt drive from a suitable source of power such as a small electric motor or other motive power. The arrangement is such that whilst the table is maintained in substantially the same plane, the resilient mounting permits a very rapid vibration of the table in that plane as the unbalanced rotor revolves, suitable means being provided, if desired, to control the intensity of the vibrations. For example, screw means may be provided for the resilient supports of spring or rubber to limit the extent of movement or vary the tension of the same, and/or the rotor may be provided with means to adjust the extent of unbalanced weight, for example, two equal weights may be provided, which when mounted diametrically opposite each other would counterbalance each other but which may be adjusted angularly relatively to each other to obtain any desired intensity of vibration.

If desired the vibrating table may be placed at a slight inclination to the horizontal plane so that the packages will be simultaneously traversed to the packer whilst being vibrated and in the case of automatic scales and the like the arrangement may be such that the circuit to the motor will be automatically completed when the balance arm or like moving part of the scale descends at the end of the weighing stroke and automatically opened when the filled package is moved.

The invention will be more particularly described with the aid of the accompanying drawings wherein the same reference letters or characters refer to the same thing or part throughout the several views, and in which

Figure 1 is a side elevation of appliance for packing containers constructed according to the invention, of which

Figure 2 is a plan view and

Figure 3 a transverse section on an enlarged line through the line 3, 3, Figure 1, and

Figure 4 is a detail cross-sectional view on the line 4, 4, Figure 3.

Referring to the drawing a vibrating table *a*, formed of wood or other rigid material is mounted on a platform formed by angle iron sides *b* connected together by cross member *b*¹, to one of which is

secured the split socket *c* by means of which the platform is mounted on the pillar *d* with a base *d'*. The socket *c* is provided with a nut and bolt *c'* for clamping the socket to the column *d* so that the height and angular position of the frame can be adjusted on the pillar.

The table *a* is carried from the framework by four strong volute springs *e* surrounded by comparatively thick rubber tubes *f* arranged near each corner to constitute a firm but resilient mounting, the resilient block at the inner left-hand corner in Figure 1 being shown in section for clearness of understanding, the arrangement being such that whilst the table *a* is normally stable it is capable of vibration as a whole within substantially the plane of support.

Below the table *a* is a cylindrical metal casing *g* secured thereto by brackets *g'*. said casing *g* having end caps *h* which are adapted to receive ball bearings *i*, the inner races of which are secured to a rotating spindle *j*, to which is keyed a segment of a cylinder *k* constituting with the spindle the unbalanced rotor or vibrating element. Rigidly secured to the protruding end of the spindle *j* is the driving pulley *l*, a counterbalance wheel or disc *m* being secured at or near the opposite end of the spindle.

Rigidly secured to the framework is an electric motor *n*, the spindle of which has keyed thereto a driving pulley *n'*, from which rotary motion is transmitted to the pulley *l* by means of the belt *o*. The motor *n* receives electric current from any suitable source of supply which is coupled to the terminal *q* and is controlled by the switch *p*.

Guide ways are formed on the top of the table by means of the central web *r*, and adjustable side webs *s*, *s'*. The resilient mounting blocks formed by the spring *e*, and rubber surrounding sheath *f* constitute firm supports for the table *a*, but when the motor *n* is started the table as a whole is vibrated in the direction of its length due to the rotation of the unbalanced member *k*, and it is found in practice that the balanced weight of the pulley *l*, counterbalanced by the balance

weight *m* located near the respective bearings and the grooves *k'* in the out of balance weight *k* which prevent skin friction, ensure smooth running of the rotor as a whole in the bearings sufficient to obviate uneven torque, wear or hammering.

By this invention simple and effective apparatus of the kind referred to is provided.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. Apparatus for packing containers with substances in a powdered, granular, flaked or other comminuted form, of the kind referred to, embodying a rigid table mounted on resilient supports and having an unbalanced rotor on a spindle journaled in bearings mounted on the underside of the platform with the out-of-balance weight arranged centrally of bearings and which is rotated by a pulley at one end, the other end being provided with a balanced rotating weight or fly wheel.

2. Apparatus for packing containers as claimed in claim 1 characterized in that the rigid table is mounted on strong volute springs surrounded by comparatively thick rubber tubes so arranged that whilst the table is normally stable it is capable of vibration as a whole within substantially the plane of support.

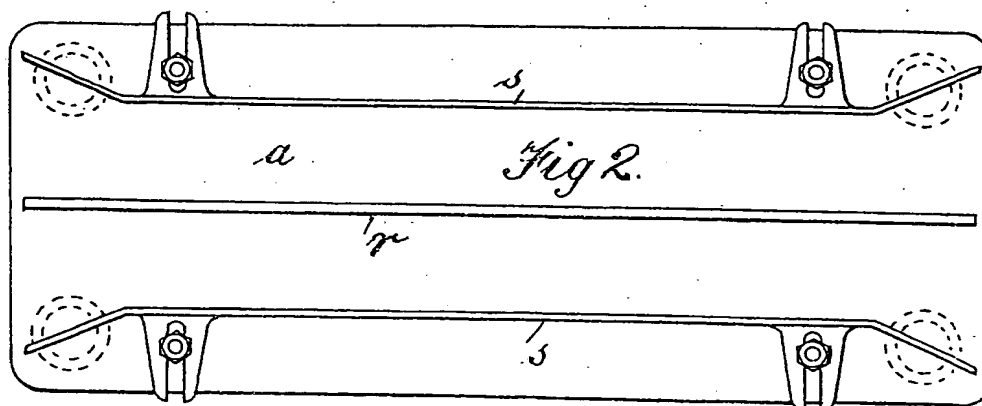
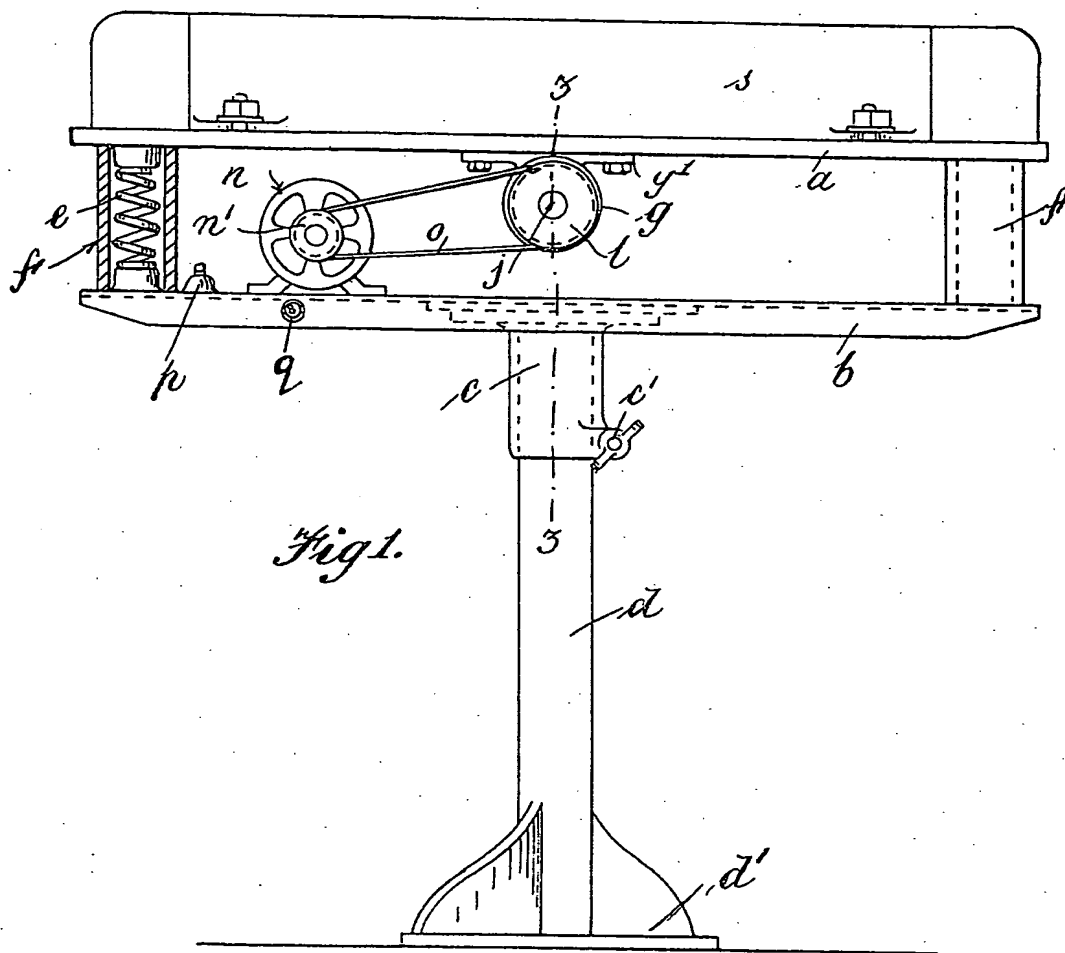
3. Apparatus for packing containers as claimed in the preceding claims characterized in that the rigid table is provided with a longitudinal guideway or guideways, the width of which can be adjusted to accommodate packages of different sizes.

4. Apparatus for packing containers constructed, arranged and operating substantially as herein described with reference to the accompanying drawings.

Dated the 11th day of November, 1939.

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9, Albert Square, Manchester, 2.

[This Drawing is a reproduction of the Original on a reduced scale.]



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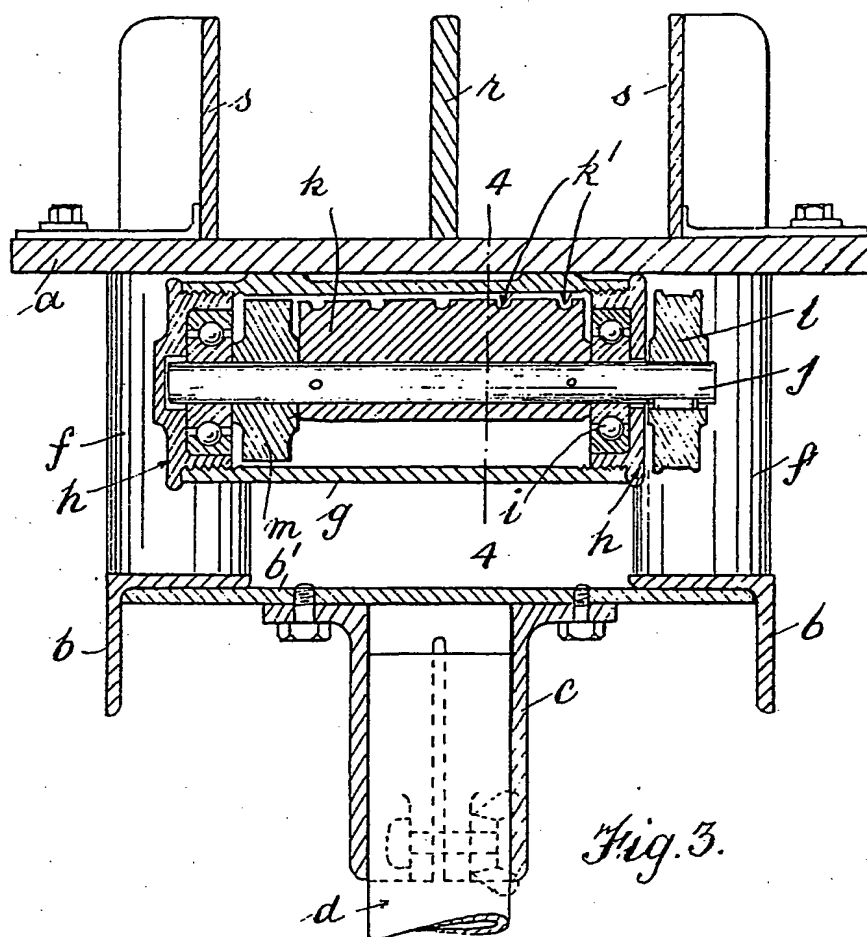
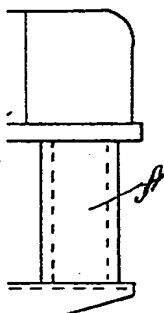


Fig. 3.

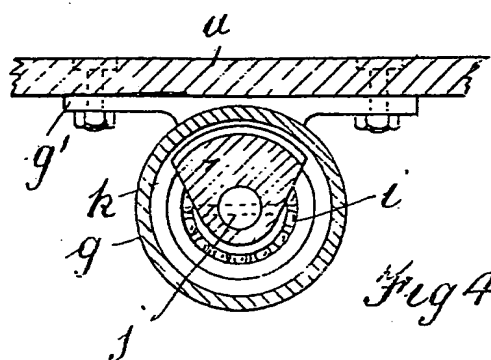


Fig. 4

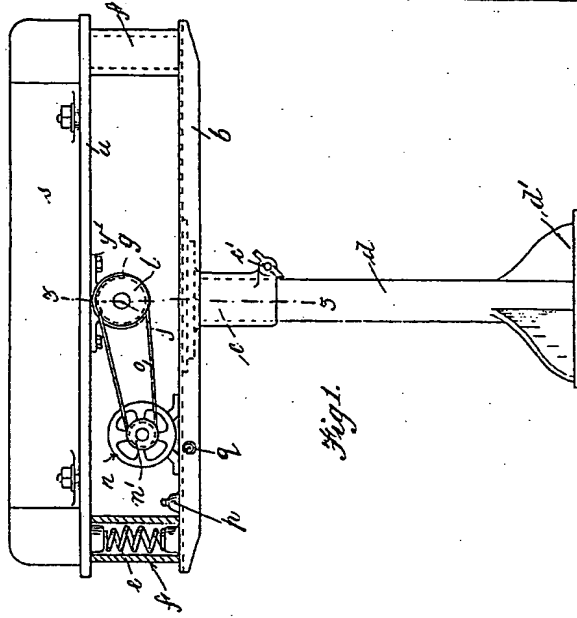


Fig. 1.

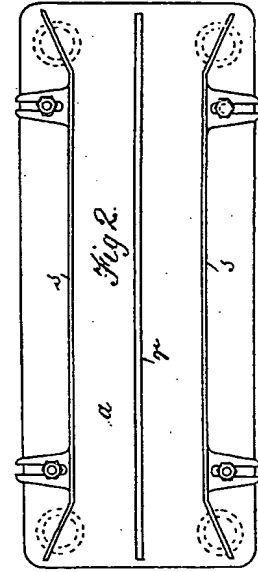


Fig. 2.

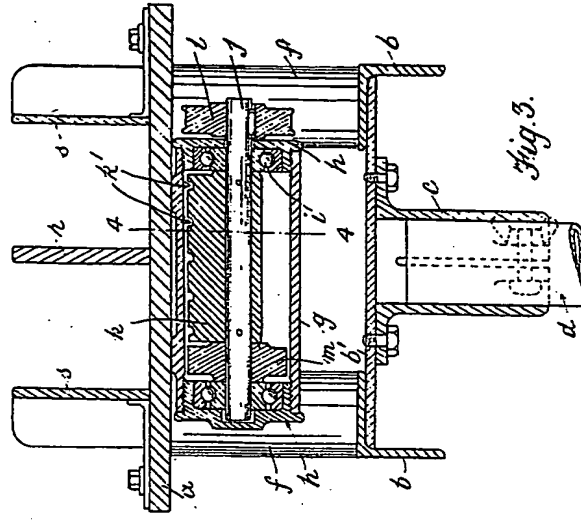


Fig. 3.

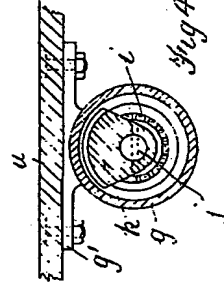


Fig. 4.

[This Drawing is a reproduction of the Original on a reduced scale]